

# Hit List

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Search Results - Record(s) 1 through 3 of 3 returned.

1. Document ID: US 5930805 A

Using default format because multiple data bases are involved.

L16: Entry 1 of 3

File: USPT

Jul 27, 1999

US-PAT-NO: 5930805

DOCUMENT-IDENTIFIER: US 5930805 A

\*\* See image for Certificate of Correction \*\*

TITLE: Storage and retrieval of ordered sets of keys in a compact 0-complete tree

DATE-ISSUED: July 27, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Marquis; Jean A.	Pasadena	CA		

US-CL-CURRENT: 707/201

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Claims](#) | [K00C](#) | [Drawn D.](#)

2. Document ID: US 5838965 A

L16: Entry 2 of 3

File: USPT

Nov 17, 1998

US-PAT-NO: 5838965

DOCUMENT-IDENTIFIER: US 5838965 A

TITLE: Object oriented database management system

DATE-ISSUED: November 17, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kavanagh; Thomas S.	Boulder	CO		
Beall; Christopher W.	Boulder	CO		
Heiny; William C.	Arvada	CO		
Motycka; John D.	Evergreen	CO		
Pendleton; Samuel S.	Louisville	CO		
Smallwood; Thomas D.	Lafayette	CO		
Terpening; Brooke E.	Golden	CO		
Traut; Kenneth A.	Boulder	CO		

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
CADIS, Inc.	Boulder	CO			02

APPL-NO: 08/339481 [PALM]  
DATE FILED: November 10, 1994

INT-CL: [06] G06 F 17/30

US-CL-ISSUED: 395/614  
US-CL-CURRENT: 707/103R

FIELD-OF-SEARCH: 395/614, 395/600

## PRIOR-ART-DISCLOSED:

## U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>3343133</u>	September 1967	Dirks	340/172.5
<u>4318184</u>	March 1982	Millett et al.	364/900
<u>4879648</u>	November 1989	Cochran et al.	364/300
<u>4887206</u>	December 1989	Natarajan	364/401
<u>4918602</u>	April 1990	Bone et al.	364/401
<u>4930071</u>	May 1990	Tou et al.	364/300
<u>4984155</u>	January 1991	Geier et al.	364/401
<u>5021992</u>	June 1991	Kondo	364/900
<u>5109337</u>	April 1992	Ferriter et al.	364/401
<u>5133075</u>	July 1992	Risch	395/800
<u>5146404</u>	September 1992	Calloway et al.	364/401
<u>5191534</u>	March 1993	Orr et al.	364/468
<u>5206949</u>	April 1993	Cochran et al.	395/600
<u>5210868</u>	May 1993	Shimada et al.	395/600
<u>5241624</u>	August 1993	Torres	395/129
<u>5257365</u>	October 1993	Powers et al.	395/600
<u>5260866</u>	November 1993	Lisinki et al.	364/401
<u>5283865</u>	February 1994	Johnson	395/161
<u>5291583</u>	March 1994	Bapat	395/500
<u>5335346</u>	August 1994	Fabbio	395/600
<u>5379430</u>	January 1995	Nguyen	395/603
<u>5418942</u>	May 1995	Krawchuck et al.	395/600
<u>5418961</u>	May 1995	Segal et al.	395/700
<u>5423038</u>	June 1995	Davis	395/650
<u>5434791</u>	July 1995	Koko et al.	364/468.03
<u>5446842</u>	August 1995	Schaeffer et al.	395/200.01
<u>5448726</u>	September 1995	Cramsie et al.	395/600
<u>5542078</u>	July 1996	Martel et al.	395/600
<u>5546577</u>	August 1996	Marlin et al.	395/614

## OTHER PUBLICATIONS

International Search Report, International Application No. PCT/US95/15028 dated Apr. 22, 1996.

ART-UNIT: 237

PRIMARY-EXAMINER: Amsbury; Wayne

ATTY-AGENT-FIRM: Baker & Botts, L.L.P.

ABSTRACT:

A database management system is disclosed having an object oriented representation of information describing characteristics of instances organized in a hierarchical structure that may be logically represented as a tree structure. The hierarchical structure includes a parent-child/class-subclass structure. The internal representation of an instance is dependent upon information that is locally available from a class to which that instance belongs plus inherited attributes from a parent class. A class is represented as a class object having a handle. The class object has a parent handle associated with it that identifies the parent class of the class object. The class object has a subclass list associated with it that identifies the handles of the classes that are subclasses of the class object. The class object has an attribute list associated with it that includes a list of handles which may be used to identify the attributes of the class object. A class object also includes a subtree instance count which represents the total number of instances that belong to that class object plus the total number of instances that are present in all of the descendants of the class object, i.e., the total number of instances that are present in that branch of the hierarchical tree structure. A graphical user interface is provided in which the hierarchical tree structure is displayed in a window showing classification structure, and a class or instance can be selected by clicking on the graphical representation of the class in the window showing classification structure. Attributes of the selected class or instance are simultaneously displayed in a window showing attribute information, which includes fields to the right of each attribute in which search criteria for that attribute may be entered. The subtree instance count is also displayed simultaneously to provide feedback to the user as to how many instances satisfy the current query, in order to facilitate guided iterative queries of the database.

47 Claims, 204 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWIC	Drawn D.
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3. Document ID: US 5758353 A

L16: Entry 3 of 3

File: USPT

May 26, 1998

US-PAT-NO: 5758353

DOCUMENT-IDENTIFIER: US 5758353 A

TITLE: Storage and retrieval of ordered sets of keys in a compact 0-complete tree

DATE-ISSUED: May 26, 1998

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Marquis; Jean A.	Pasadena	CA		

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE	CODE
Sand Technology Systems International, Inc.	Westmount			CA	03	

APPL-NO: 08/565939 [PALM]

DATE FILED: December 1, 1995

INT-CL: [06] G06 F 17/30

US-CL-ISSUED: 707/201; 707/200

US-CL-CURRENT: 707/201; 707/200

FIELD-OF-SEARCH: 395/601, 395/602, 395/603, 395/607, 395/608, 395/609, 395/610, 395/611, 395/612, 395/613, 395/614, 395/615, 395/616, 395/617, 395/618, 395/619, 395/620, 395/621

## PRIOR-ART-DISCLOSED:

## U. S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>4429385</u>	January 1984	Cichelli et al.	370/92
<u>4468728</u>	August 1984	Wang	364/200
<u>4586027</u>	April 1986	Tsukiyama et al.	340/347
<u>4611272</u>	September 1986	Lomet	364/200
<u>4677550</u>	June 1987	Ferguson	364/300
<u>4945475</u>	July 1990	Bruffey et al.	364/200
<u>5036457</u>	July 1991	Glaser et al.	395/500
<u>5093779</u>	March 1992	Sakurai	395/600
<u>5121493</u>	June 1992	Ferguson	395/600
<u>5202986</u>	April 1993	Nickel	395/600
<u>5204958</u>	April 1993	Cheng et al.	395/600
<u>5210870</u>	May 1993	Baum et al.	395/607
<u>5274805</u>	December 1993	Ferguson et al.	395/600
<u>5283894</u>	February 1994	Deran	395/600
<u>5293616</u>	March 1994	Flint	395/600
<u>5301314</u>	April 1994	Gifford et al.	395/612
<u>5303367</u>	April 1994	Leenstra, Sr. et al.	395/600
<u>5307486</u>	April 1994	Nakamigawa	395/600
<u>5404513</u>	April 1995	Powers et al.	395/600
<u>5408652</u>	April 1995	Hayashi et al.	395/601
<u>5497485</u>	March 1996	Ferguson et al.	395/601
<u>5551027</u>	August 1996	Choy et al.	395/617
<u>5555409</u>	September 1996	Leenstra, Sr. et al.	395/600

5557786

September 1996

Johnson, Jr.

395/612

## OTHER PUBLICATIONS

Ratko Orlandic, "Design, Analysis and Applications of Compact 0-Complete Trees," May 1989, 185p.

Biliris, "The Performance of Three Database Storage Structures for Managing Large Objects," AT&T Bell Laboratories, Murray Hill, New Jersey, 1992, pp. 276-285.

Orlandic, "Design, Analysis and Applications of Compact 0-Complete Trees," Dissertation, School of Engineering and Applied Science, University of Virginia, May 1989, 185p.

Orlandic, "A High-Precision Spatial Access Method Based on a New Linear Representation of Quadress," Proceedings of the ISMM International Conference, Information and Knowledge Management CIKM-92, Baltimore, Maryland, Nov. 8-11, 1992, pp. 499-508.

Orlandic, "Problems of Content-Based Retrieval in Image Databases," Proceedings Third Symposium on New Generation Knowledge Engineering, IAKE 1992, Washington, D.C., Nov. 1992, pp. 374-384.

Orlandic et al., "Q.sub.0 -Tree: A Dynamic Structure for Accessing Spatial Objects with Arbitrary Shapes," Institute for Parallel Computation, School of Engineering and Applied Science, University of Virginia, Charlottesville, Virginia, Dec. 6, 1991, 41p.

Pfaltz, "The ADAMS Language: A Tutorial and Reference Manual," Department of Computer Science, University of Virginia, Charlottesville, Virginia, Apr. 1993, 67p.

Pfaltz et al., "Implementing Subscripted Identifiers in Scientific Databases," Lecture Notes in Computer Science 420, Springer-Verlag, Berlin, Apr. 3-5, 1990, pp. 80-91.

Donald E. Knuth, "The Art of Computer Programming," Sorting and Searching, vol. 3, 1973, pp. 471-479.

Orlandic et al., "Compact 0-Complete Trees," Proceedings of the 14th VLDB Conference, Los Angeles, California, 1988, pp. 372-381.

Orlandic et al., "Analysis of Compact 0-Complete Trees: A New Access Method to Large Databases," Lecture Notes in Computer Science, Fundamentals of Computational Theory, International Conference FCT '89., Aug. 21-25, 1989, pp. 362-371.

Normann et al., Abstract of "Recent experience with C-tree--a data management system," Europhysics Conference on Control Systems for Experimental Physics. Proceedings (CERN 90-08), 1990, pp. 167-169.

Kida et al., Abstract of "A topological condition imposed on the natural frequencies of two element kind network," Transactions of the Institute of Electronics and Communication Engineers of Japan, Section E, vol. E60, No. 8, 1977, pp. 417-418.

Werelius, Abstracts of "C file libs reviewed: Ten packages for file management form C are put through real-world paces to test speed and flexibility," Buyer and Vendor Guide, DBMV v. 4 n.8, 1991, pp. 70-75.

Bender, Abstract of "B-Tree/ISAM file handlers," Micro/Systems Journal: For The Advanced Computer User, Jan./Feb. 1987, pp. 58-60.

Aoe, Abstract of "Computer algorithms: key search strategies," IEEE Computer Society Technology Series., 1991, pp. 1-139.

Smith, Abstract of "New Approaches to Balanced Tree Data Structures (Simple Balanced Search Tree)," Univ. of Louisville, vol. 55/02-B of Dissertation Abstracts International, 1993, pp. 497-617.

Johnson, Abstract of "Treemaps: Visualizing Hierarchical and Categorical Data," University of Maryland, vol. 55/04-B of Dissertation Abstracts International, 1993, pp. 1516-1849.

Fachini, Abstract of "C-Tree Systolic Automata," Theoretical Computer Science, V56, N2, 1988, pp. 155-186.

Liu, Abstract of "The distances between unrooted and cyclically ordered trees and their computing methods," IEICE Transactions on Information and Systems, vol. E77-

D, No. 10, 1994, pp. 1094-1105.

Hulten, "An index organization for applications with highly skewed access patterns," 5th International Conference on Software Engineering, Mar. 9-12, 1981, pp. 71-78.

"E-Mail Message to J. Marquis", Pfalte, Aug. 24, 1995.

ART-UNIT: 237

PRIMARY-EXAMINER: Black; Thomas G.

ASSISTANT-EXAMINER: Ho; Ruay Lian

ATTY-AGENT-FIRM: Christie, Parker & Hale, LLP

ABSTRACT:

A computer storage system and processing method for indexing and accessing data stored in the computer storage system, comprising a compact multi-way search tree structure. The method employs a B-tree like search algorithm that is independent of key type or key length because all keys in index blocks are encoded by a log.<sub>sub.2</sub> M bit surrogate, where M is the maximal key length. A buffer consisting of a sorted list of key values can be directly transformed into a representation of a C.<sub>sub.0</sub> - tree.

33 Claims, 26 Drawing figures

[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#) | [Claims](#) | [KWC](#) | [Drawn D](#)

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Term	Documents
HIERARCHICAL	64577
HIERARCHICALS	0
TREE	161949
TREES	72440
(15 AND (HIERARCHICAL NEAR TREE)) . PGPB, USPT, USOC, EPAB, JPAB, DWPI, TDBD.	3
(L15 AND (HIERARCHICAL NEAR TREE)) . PGPB, USPT, USOC, EPAB, JPAB, DWPI, TDBD.	3

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Search Results - Record(s) 1 through 5 of 5 returned.

1. Document ID: US 20040199537 A1

Using default format because multiple data bases are involved.

L17: Entry 1 of 5

File: PGPB

Oct 7, 2004

PGPUB-DOCUMENT-NUMBER: 20040199537

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040199537 A1

TITLE: System for storing and retrieving database information

PUBLICATION-DATE: October 7, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Duff, Robert Cory	Issaquah	WA	US

US-CL-CURRENT: 707/102

[Full](#) [Title](#) [Citation](#) [Front](#) [Review](#) [Classification](#) [Date](#) [Reference](#) [Sequences](#) [Attachments](#) [Claims](#) [KINDC](#) [Drawn D](#)

2. Document ID: US 20030033278 A1

L17: Entry 2 of 5

File: PGPB

Feb 13, 2003

PGPUB-DOCUMENT-NUMBER: 20030033278

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030033278 A1

TITLE: Data sort method, data sort apparatus, and data sort program

PUBLICATION-DATE: February 13, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Abe, Fumirou	Kawasaki		JP
Matsuura, Masataka	Kawasaki		JP
Tabata, Yoko	Kawasaki		JP
Nagata, Masahiko	Fukuoka		JP
Hara, Yasuhisa	Fukuoka		JP

US-CL-CURRENT: 707/1

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMIC	Drawn D.
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3. Document ID: US 5826259 A

L17: Entry 3 of 5

File: USPT

Oct 20, 1998

US-PAT-NO: 5826259

DOCUMENT-IDENTIFIER: US 5826259 A

TITLE: Easily expandable data processing system and method

DATE-ISSUED: October 20, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Doktor; Karol	Wheelers Hill			AU

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE	CODE
Financial Systems Technology Pty. Ltd.	Melbourne			AU	03	

APPL-NO: 08/862176 [PALM]

DATE FILED: May 22, 1997

PARENT-CASE:

This application is a continuation of application Ser. No. 08/439,207, filed May 11, 1995, now U.S. Pat. No. 5,675,779 which is a divisional of Ser. No. 08/083,361, filed Jun. 28, 1993 now issued; which is a continuation of Ser. No. 07/526,424, filed May 21, 1990, now abandoned.

INT-CL: [06] G06 F 17/30

US-CL-ISSUED: 707/4; 707/1

US-CL-CURRENT: 707/4; 707/1

FIELD-OF-SEARCH: 707/1, 707/2, 707/3, 707/4, 707/5, 707/6, 707/7, 707/8, 707/9, 707/10, 707/100, 707/101, 707/102, 707/103, 707/104, 707/200, 345/352, 345/335

PRIOR-ART-DISCLOSED:

U. S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>3618027</u>	November 1971	Feng	340/172.5
<u>3670310</u>	June 1972	Bharwani et al.	340/172.5
<u>4128891</u>	December 1978	Lin et al.	364/900
<u>4497039</u>	January 1985	Kitakami et al.	364/900
<u>4498145</u>	February 1985	Baker et al.	364/900
<u>4575798</u>	March 1986	Lindstrom et al.	364/300
<u>4631664</u>	December 1986	Bachman	364/200

<u>4670848</u>	June 1987	Schramm	364/513
<u>4791561</u>	December 1988	Huber	364/300
<u>4807122</u>	February 1989	Baba	364/200
<u>4829427</u>	May 1989	Green	364/300
<u>4893232</u>	January 1990	Shimaoka et al.	364/200
<u>4901229</u>	February 1990	Tashiro et al.	364/200
<u>4918593</u>	April 1990	Huber	364/200
<u>4930071</u>	May 1990	Tou et al.	364/300
<u>4930072</u>	May 1990	Agrawal et al.	364/300
<u>4933848</u>	June 1990	Haderle et al.	364/300
<u>4947320</u>	August 1990	Crus et al.	364/200
<u>4967341</u>	October 1990	Yamamoto et al.	364/200
<u>5133068</u>	July 1992	Crus et al.	395/600
<u>5168565</u>	December 1992	Morita	395/600
<u>5226158</u>	July 1993	Horn et al.	395/600
<u>5239663</u>	August 1993	Faudemay et al.	395/800
<u>5369761</u>	November 1994	Conley et al.	707/2
<u>5379419</u>	January 1995	Heffernan et al.	395/600
<u>5386557</u>	January 1995	Boykin et al.	395/600
<u>5386559</u>	January 1995	Eisenberg et al.	395/600
<u>5408657</u>	April 1995	Bigelow et al.	395/600
<u>5459860</u>	October 1995	Burnett et al.	707/101
<u>5488722</u>	January 1996	Potok	395/600
<u>5504885</u>	April 1996	Alashqur	395/600
<u>5539870</u>	July 1996	Conrad et al.	345/352
<u>5542073</u>	July 1996	Schiefer et al.	395/600
<u>5548749</u>	August 1996	Kroenke et al.	395/600
<u>5581785</u>	December 1996	Nakamura et al.	707/103
<u>5664177</u>	September 1997	Lowry	707/100

## OTHER PUBLICATIONS

El-Sharkawi et al., "The Architecture and Implementation of ENLI: Example-Based Natural Language-Assisted Interface", 1990 IEEE, pp. 430-432.

Kiefer et al., "SYGRAF: Implementing Logic Programs in a Database Style", IEEE Transaction on Software Engineering, vol. 14, No. 7, Jul. 1988, pp. 922-935.

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Yu et al., "Automatic Knowledge Acquisition and Maintenance for Sematic Query Optimization", IEEE Transactions on Knowledge and Data Engineering, vol. 1, No. 3, Sep. 1989, pp. 362-375.

Wilschut et al., "Pipelining in Query Execution", 1990 IEEE, Copyright 1990, p. 562.

"Extended Disjunctive Normal Form for Efficient Processing of Recursive Logic Quires", IBM Technical Disclosure Bulletin, vol. 30, No. 1, Jun. 1987, pp. 360-366.

ART-UNIT: 271

PRIMARY-EXAMINER: Black; Thomas G.

ASSISTANT-EXAMINER: Ho; Buay Lian

ATTY-AGENT-FIRM: Skjerven, Morrill, MacPherson, Franklin & Friel LLP Kwok; Edward C.

## ABSTRACT:

Machine automated techniques are described for a method of data processing called Relationships Processing. A computing system is disclosed which provides for the high speed recording and extraction of data objects (entities) and for the development data representing a queried relationship between the entities. The system is expandable to handle the relatively voluminous data bases of large, commercial data repositories. A user defines set of entities and allowed relationships between the entities. The user can expand this set of allowed entities and relationships at any time during the life of the system without reprogramming or compiling of computer program code or disrupting concurrent operational use of the system. Large systems can now be built that are no longer limited to a scope of design requirements known during initial systems development. For a given set of defined relationships the system allows the user to perform complex inquiries (again without programming at the code level) that would normally require multiple nested inquiries to be coded programmatically and would not achieve the performance levels of the Relationships Processor.

18 Claims, 24 Drawing figures

Full Title Citation Front Review Classification Date Reference Claims KMC Draw D

□ 4. Document ID: US 5764974 A

L17: Entry 4 of 5

File: USPT

Jun 9, 1998

US-PAT-NO: 5764974

DOCUMENT-IDENTIFIER: US 5764974 A

**TITLE:** System with user specified pattern definitions for matching input messages and associated decisions for conditionally responding to the input messages

DATE-ISSUED: June 9, 1998

**INVENTOR-INFORMATION:**

NAME	CITY	STATE	ZIP CODE	COUNTRY
Walster; James Earl	Roseville	MN		
Wiggins; Mark Anthony	St. Paul	MN		

**ASSIGNEE- INFORMATION:**

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Unisys Corporation	Blue Bell	PA			02

APPL-NO: 08/521003 [PALM]  
DATE FILED: August 30, 1995

**PARENT-CASE:**

CROSS-REFERENCE This patent application is related to the co-pending patent Application No., 08/521,203, entitled, "APPARATUS AND METHOD FOR MESSAGE MATCHING USING PATTERN DECISIONS IN A MESSAGE MATCHING AND AUTOMATIC RESPONSE SYSTEM," filed on Aug. 30, 1995 by Walster et al.

INT-CL: [06] G06 F 17/30

US-CL-ISSUED: 395/606; 395/603, 395/604, 395/21, 395/54

US-CL-CURRENT: 707/6; 706/20, 706/50, 707/3, 707/4

FIELD-OF-SEARCH: 395/603, 395/604, 395/606, 395/21, 395/54

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>3614328</u>	October 1971	McNaughton et al.	179/15AT
<u>4285049</u>	August 1981	Bird et al.	364/900
<u>4341929</u>	July 1982	Alexander et al.	179/90B
<u>4608460</u>	August 1986	Carter et al.	179/6.11
<u>4791556</u>	December 1988	Vilkaitis	364/200
<u>4922519</u>	May 1990	Daudelin	379/67
<u>4979206</u>	December 1990	Padden et al.	379/67
<u>5163083</u>	November 1992	Dowden et al.	379/88
<u>5180309</u>	January 1993	Egnor	434/323
<u>5282265</u>	January 1994	Rohra Suda et al.	395/12
<u>5315711</u>	May 1994	Barone et al.	395/275
<u>5379340</u>	January 1995	Overend et al.	379/93
<u>5418943</u>	May 1995	Borgida et al.	395/600
<u>5485531</u>	January 1996	Ichinohe et al.	382/198
<u>5576951</u>	November 1996	Lockwood	395/227
<u>5627940</u>	May 1997	Rohra et al.	395/12

ART-UNIT: 237

PRIMARY-EXAMINER: Black; Thomas G.

ASSISTANT-EXAMINER: Homere; Jean R.

ATTY-AGENT-FIRM: Johnson; Charles A. Starr; Mark T.

ABSTRACT:

A system for automatically and variably responding to character-based messages is disclosed. With user specified input, a software tool creates a pattern database. The pattern database consists of pattern definitions for matching input messages and response definitions for automatically responding to matching input messages. Pattern definitions define criteria for matching an input message. The response definitions include function definitions and optional function decisions. Functions to be performed in response to a matching message are specified in the function

definitions, wherein performance of the specified functions is dependent upon evaluation of the function decisions.

22 Claims, 40 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KMC	Draw
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5. Document ID: US 5604899 A

L17: Entry 5 of 5

File: USPT

Feb 18, 1997

US-PAT-NO: 5604899

DOCUMENT-IDENTIFIER: US 5604899 A

**TITLE:** Data relationships processor with unlimited expansion capability

DATE-ISSUED: February 18, 1997

**INVENTOR-INFORMATION:**

NAME	CITY	STATE	ZIP CODE	COUNTRY
Doktor; Karol	Wheelers Hill	.		AU

**ASSIGNEE- INFORMATION:**

NAME	CITY	STATE ZIP	CODE	COUNTRY	TYPE	CODE
Financial Systems Technology Pty. Ltd.	Melbourne			AU	03	

APPL-NO: 08/083861 [PALM]

DATE FILED: June 28, 1993

**PARENT-CASE:**

This is a continuation of application Ser. No. 07/526,424, filed May 21, 1990, now abandoned.

INT-CL: [06] G06 F 1/00, G06 F 15/00

US-CL-ISSUED: 395/603; 364/DIG.7, 364/282.1, 364/282.2, 364/282.3, 364/283.1, 364/283.4

US-CL-CURRENT: 707/3

FIELD-OF-SEARCH: 395/600, 364/283.4, 364/225.4, 364/963, 364/252.4

**PRIOR-ART-DISCLOSED:**

U. S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>3618027</u>	November 1971	Feng	364/900
<u>3670310</u>	June 1972	Bharwani et al.	395/603
<u>4128891</u>	December 1978	Lin et al.	364/900
<u>4497039</u>	January 1985	Kitakami et al.	364/900

<u>4498145</u>	February 1985	Baker et al.	364/900
<u>4575798</u>	March 1986	Lindstrom et al.	364/300
<u>4631664</u>	December 1986	Bachman	364/200
<u>4670848</u>	June 1987	Schramm	364/513
<u>4791561</u>	December 1988	Huber	364/300
<u>4807122</u>	February 1989	Baba	364/200
<u>4829427</u>	May 1989	Green	364/300
<u>4893232</u>	January 1990	Saimaoka et al.	364/200
<u>4901229</u>	February 1990	Tashiro et al.	364/200
<u>4918593</u>	April 1990	Huber	364/200
<u>4930071</u>	May 1990	Tou et al.	364/300
<u>4930072</u>	May 1990	Agrawal et al.	364/300
<u>4967341</u>	October 1990	Yamamoto et al.	364/200
<u>5133068</u>	July 1992	Crus et al.	395/600
<u>5168565</u>	December 1992	Morita	395/600
<u>5239663</u>	August 1993	Faudemay	395/800

## OTHER PUBLICATIONS

Korth and Silberschatz, Database System Concepts, McGraw-Hill Book Company (New York, 1986), pp. 45-105; pp. 301-323.

"Extended Disjunctive Normal Form for Efficient Processing of Recursive Logic Queries", IBM Technical Disclosure Bulletin, vol. 30 No. 1, Jun. 1987 pp. 360-366.

Yu et al, "Automatic Knowledge Acquisition and Maintenance For Semantic Query Optimization", IEEE Transactions on Knowledge and Data Engrn, V:1, No. 3 Sep. 1989, pp. 362-375.

Kifer et al, "Sygraf: Implementing Logic Programs in a Database Style" IEEE Transactions on Software Engnrrn. v:14, N7, Jul. 1988 pp. 92-935.

El-Sharkawi et al, "The Architecture and Implementation of Enli: An Example-Based Natural Language Assisted Interface", Parbase 90 Intl. Conf. on Databases, Parallel Architectures & Their Applications, 7-9 Mar. 1990.

Wilschut et al, "Pipelining in Query Execution" Parbase-90 Intl. Conf. on Databases, Parallel Architectures and Their Applications, 7-9 Mar. 1990 p. 562.

ART-UNIT: 236

PRIMARY-EXAMINER: Kriess; Kevin A.

ASSISTANT-EXAMINER: Toplu; Lucien

ATTY-AGENT-FIRM: Skjerven, Morrill MacPherson, Franklin & Friel Winters; Paul J. Kwok; Edward C.

ABSTRACT:

Machine automated techniques are described for a method of data processing called Relationships Processing. A computing system is disclosed which provides for the high speed recording and extraction of data objects (entities) and for the development data representing a queried relationship between the entities. The system is expandable to handle the relatively voluminous data bases of large, commercial data repositories.

A user defines set of entities and allowed relationships between the entities. The

user can expand this set of allowed entities and relationships at any time during the life of the system without reprogramming or compiling of computer program code or disrupting concurrent operational use of the system. Large systems can now be built that are no longer limited to a scope of design requirements known during initial systems development. For a given set of defined relationships the system allows the user to perform complex inquiries (again without programming at the code level) that would normally require multiple nested inquiries to be coded programmatically and would not achieve the performance levels of the Relationships Processor.

8 Claims, 22 Drawing figures

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<u>L16</u>	L15 and (hierarchical near tree)	3	<u>L16</u>
<u>L15</u>	L14 and (character near string)	58	<u>L15</u>
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<u>L9</u>	L8 and ndex\$	3	<u>L9</u>
<u>L8</u>	707/101.ccls. and index\$	976	<u>L8</u>
<u>L7</u>	L2 and (relational near join)	2	<u>L7</u>
<u>L6</u>	L2 and (color\$ near algorithm)	2	<u>L6</u>
<u>L5</u>	l2 and (cyclic or acyclic)	3	<u>L5</u>
<u>L4</u>	L3 and digraph\$	2	<u>L4</u>
<u>L3</u>	L2 and clique\$	2	<u>L3</u>
<u>L2</u>	L1 and (semistructur\$ near data)	65	<u>L2</u>
<u>L1</u>	707/\$.ccls.	30172	<u>L1</u>

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